

ABSTRACT OF THE DISCLOSURE

A molecular single electron transistor (MSET) detector device (14) is described that comprises at least one organic molecule (87) connecting a drain electrode (84) and a source electrode (82). In use, said at least one organic molecule (87) provides a quantum confinement region. At least one analyte receptor site (90, 92) is provided in the vicinity of said at least one organic molecule (87) that bind molecules of interest (analytes). A fluid analyser (2) is also described that includes the MSET detector, a pre-concentrator (4) and a fluid gating structure (6). The fluid gating structure (6) is arranged to selectively route fluid from the pre-concentrator (4) to either one of the detector (14) and an exhaust port (12). The pre-concentrator (4), fluid gating structure (6) and detector (14) are each formed as substantially planar layers and arranged in a stack or cube.